

A LETTER,

RESPECTFULLY ADDRESSED

TO THE COMMISSIONERS

FOR

TRANSPORTS, SICK AND WOUNDED SEAMEN,

&c. &c. &c.

ON THE SUBJECT OF THE

Operation for Popliteal Aneurism.

ILLUSTRATED BY CASES,

AND THE

DESCRIPTION OF A NEW INSTRUMENT.

BY

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LETTER

TO

THE COMMISSIONERS FOR TRANSPORTS, SICK
AND WOUNDED SEAMEN, &c. &c. &c.

*Royal Naval Hospital, Deal,
16th May, 1811.*

GENTLEMEN,

NO science has made a more rapid progress towards attaining perfection, within the last fifty years, than that of Surgery; and surely none can be more generally useful. Its importance and utility will be still farther appreciated, when we consider the vast increase of our naval and military equipments for a war of unexampled continuance and devastation; many of the evils of which it either wholly removes or tends considerably to mitigate.

The public appointment which I hold as Surgeon to this Hospital, and the wide field for practical observation that necessarily lies open before me, renders it a duty I owe the Profession, to lay be-

fore it, from time to time, such observations as I may have made, with a view to the promotion of scientific knowledge. I therefore, with diffidence, submit to the consideration of the Profession, a few remarks on the operation for Popliteal Aneurism; illustrated by the relation of two cases, and the description of a finger instrument invented by me, to facilitate the performance of that operation.

The late highly and justly celebrated Mr. John Hunter was the first who performed the operation for Popliteal Aneurism on the fore part of the thigh; to which he was led by the frequent failure of the operation in laying open the aneurismal sac, and tying the artery close to the diseased parts, where he conceived the vessel to be unsound: and hence the failures*.

Mr. Hunter recommended the cutting down upon the artery by the inner margin of the sartorius muscle; and in this he has been followed, as far as I am acquainted, by every operator and teacher of surgery, up to the present day, Mr. Charles Bell excepted.

* See Mr. Wislart's translation of Professor Scarpa's book on the anatomy, pathology, and surgical treatment of Aneurism, p. 257, § 16, 17, and 18, where the principle of tying the artery above the sac is ascribed to Anel, a very old surgeon; but the operation performed by Anel was at the bend of the arm only; and it will there be found also, that Mr. Hunter was the first who pointed out the necessity of tying the femoral artery in the fore part of the thigh for Popliteal Aneurism, without any previous knowledge of Anel's publication on that interesting subject.

But as this gentleman, in his first volume of *Operative Surgery*, merely advises the cutting down upon the artery by the *outer* margin, without assigning his reasons for such a preference; it is my intention to state, with as much brevity as possible, the advantages, as they appear to me, to be derived from this method over that of Mr. Hunter's; and, at the same time, to point out the only objection that can be raised against it, to enable professional gentlemen to judge for themselves.

By making the incision upon the inner margin of the sartorius, the vena saphena major comes immediately in the way, and will be divided five times out of seven; consequently a considerable flow of blood may be expected to ensue—but it is not the simple division of the vein, nor the probability of cutting off this channel for the returning blood of the leg, which are the reasons why this vessel should be avoided, for we all know the femoral vein itself to be fully adequate to the office: but it is the embarrassment which the bleeding will occasion to the operator, during the subsequent steps of so nice and intricate a dissection.

In this direction, also, the principal lymphatics of the leg pass, which, most probably, will be divided with the vein; and should there exist much œdema of the leg, by no means an unusual circumstance where the aneurismal tumour happens to be large, the absorption of the effused serum will be tedious in the extreme.

It frequently happens, likewise, that the external wound is kept open, for a considerable length of time after the ligatures have come away, by a profuse discharge of lymph from the wounded ends of these vessels. In confirmation of which statement, I appeal to all those who are in the habit of performing this operation*.

By securing the artery from the upper or *outer* margin of the sartorius muscle, no such objections can be urged—there are no large veins or lymphatics in the way of the knife, and the operation will be finished in as short a time, with as little pain to the patient, and certainly with much greater satisfaction to the operator, from his not being embarrassed by hæmorrhage; a circumstance so frequently occurring, when operating on the part as directed by Mr. Hunter. In the first of the two cases I am about to relate, not more than half an ounce of blood was lost, and the greater part of that quantity came from a minute cuticular artery. In the last, I positively assert, there was not more in all than *two drachms*. In fact, the operation performed in this way may be very aptly compared to that upon the dead subject, with the advantage of a beating artery to guide and direct you.

Having said thus much in favour of operating by the outer margin of the sartorius, I come now to

* See also a case in the Transactions of a Society for the Improvement of Medical and Surgical Knowledge. Vol. I.

lay before you the only objection that can possibly be brought against it: an objection that would naturally arise in the mind of every reflecting practitioner. The artery may be said to be nearer the inner than the outer margin of the sartorius—this muscle will be necessarily more disturbed in the operation—its cellular connexions to the subjacent parts will be destroyed to a greater extent; and consequently the formation of larger collections of pus more favoured, which have not so ready an exit, from the incision being less dependent.

In answer to all this, Gentlemen, I beg first to observe, that where the operation is performed in the middle of the thigh, or still more if higher up, the artery does certainly maintain the course above stated: but about an inch or an inch and half above the part where it pierces the tendon of the triceps muscle, (the point I would recommend it to be tied at) the sartorius crosses the artery covered only by its sheath, and where it will be found fully as near the outer, as the inner margin of that muscle. This being a clearly established fact, I would therefore ask, why should a preference be given to the method pursued by Mr. Hunter? for surely the lower the artery is tied on the forepart of the thigh for Popliteal Aneurism, the greater will be the chance of the inferior parts of the limb being properly nourished; and should any accident occur, such as secondary hæmorrhage, the artery may be tied higher up, or amputation may be performed,

with a much greater prospect of success, than if the vessel in the first instance were tied half way between the middle of the thigh and Poupart's ligament? *

Secondly—In order to obviate the chance of large collections of matter forming under the muscle, the first circumstance to which our attention will naturally be directed, is the speedy removal of the exciting causes of inflammation; and the chief of these will, no doubt, appear to be the ligatures, which, acting as extraneous bodies, keep up that degree of irritation in the wound, highly favourable to this secretion. It becomes, therefore, an object of no inconsiderable degree of interest to accelerate the separation of these exciting causes, at as early a period as can be done with safety. With this view it is my uniform practice, after the 12th day, in all capital operations where an artery of magnitude is concerned, to take hold of both ends of the ligature—to keep it gently on the stretch, and to twist it between the finger and thumb, which has the effect of tightening the noose. The ligature is then placed upon the adjoining sound parts, and retained in this twisted state, by means of a slip of adhesive plaster laid over it, until next dressing; when, should the ligature be found not detached from the end of the artery, the noose is tightened

* See Mr. Ramsden's book on Diseases of the Testicle, and on Aneurism, pages 345-6-7. Published in 1810.

still more by the same process. In this way I have invariably succeeded, excepting in one instance,* in removing the ligature after the 2nd day of practising this simple operation, and that without a single drop of arterial blood following †.

With respect to the dependence of the wound—a wound situated, as that described above, may be made as dependant as can be wished for, by position alone, and still the relaxed state of the muscles on the fore part of the thigh maintained. In Serjeant Froadsham's case, the 1st I am about to relate, there was certainly a collection of matter formed under

* See Burnet Allan's case at the end of this paper.

† His Majesty's ship *Acasta* arrived in the Downs from the West Indies, in August 1809; and, among a number of invalids sent from that ship to the hospital, was a black seaman, by the name of Frank, who had his arm amputated above the elbow six months previous to his admission; and, even at that distant period from the operation, there still remained a ligature, or rather I should say, a *cord*, hanging out from the stump, which otherwise was completely healed. Frequent attempts were made by the surgeon, during the passage home, to detach it, but without success. After the patient's admission into the hospital, I used every effort consistent with prudence to remove it, but it was found so firmly attached, that I am persuaded the cord would have broken rather than have separated at its noose. Both ends of this cord happened fortunately to be left together; and, after the second day of performing the operation of twisting, it came away, accompanied by a small, opaque, hard, and irregularly round substance, not unlike a middle sized pearl: very probably the end of a nerve which had been included in the noose with the artery.

the sartorius; but after the ligatures came away, which was on the 13th and 14th days, the discharge lessened gradually until the 29th, when it entirely ceased; and on the 33rd the wound was cicatrised, when the patient was enabled to walk the distance of a mile, to the Port Admiral's Office, to solicit a passage in a man of war bound to Plymouth, for the purpose of joining his division. In Burnett Allan's case there was not a single drop of discharge from under the muscle, except the little that was formed along the course of the ligatures: adhesion in the first instance having taken place between the sides of the wound, from its fundus upwards; and on the expiration of 30 days, this was also completely cicatrised, when he was enabled to walk about the ward, without any apparent difficulty.

I beg farther to observe, that in both the cases here detailed, the sartorius muscle had suffered no injury whatever, all its functions continuing equally perfect as if no disease had previously existed, or any operation taken place. And, with respect to its disturbance during the operation, I have only to add, that there was not a fibre of it divided, nor did it shew the smallest tendency to be thrown into involuntary action, by the degree of irritation consequent upon its cellular connexions to the subjacent parts being destroyed; which in both cases was rather more than half way across its whole width. I beg to call the particular attention of the reader to these remarks, as I am fully aware,

that the doctrine of the extreme irritability of the sarto-rius, has been sedulously inculcated from high professional authority.

CASE I.

Serjeant Froadsham, of the Marines, aged forty-eight, came under my care, from his Majesty's ship Bellona, on the 26th June, 1810, with a large aneurismal tumor situated on the fore part of the thigh, occupying one-third of its whole length from the inner condyle of the femur upwards, in the direction of the artery. The disease was of nearly five years standing, brought on by a long and fatiguing march to head-quarters, with a deserter. According to the account given by the patient himself, he felt something snap in his thigh, as he was ascending a hill, which produced considerable pain at the time; but after two or three days rest, this pain subsided, and he walked about as usual—three or four days after this the pain returned, and on his examining the part, he discovered a small pulsating tumor, not larger than the size of a hazel nut.

On his admission into the hospital the circumference of the thigh over the aneurismal tumor was five inches greater than the opposite one at the same point; and although the integuments over it were greatly distended, there was neither inflammation,

or any other morbid appearance of the parts, save that of a small ecchymosed spot, the size of the point of one's finger, which did not appear to me to have any connexion with the disease in question. The blood in the sac was fluid, and the pulsations of the tumor were strong—his leg and foot were slightly œdematous—he had considerable pain in the knee, and had not been able to walk for many months—he was of a very irritable habit, and had laboured under an asthmatic cough for upwards of fourteen years.—His bowels were opened— $\frac{3}{4}$ xvi. of blood were taken from the arm, and on the 5th July the operation was performed in the following manner :

A tourniquet being loosely applied round the upper part of his thigh, and a flannel roller passed round his foot and leg ; the patient was laid upon the table in the operation-room, with the muscles, on the anterior part of the thigh, a little relaxed, by means of pillows placed under the outside of the knee : an incision, nearly four inches in length, was made with one stroke of the scalpel down to the outer margin of the sartorius muscle, terminating at the commencement of the tumor : the muscle being thus exposed, was separated from its bed by the handle of the scalpel, fully half way across its width ; the femoral artery became then apparent beating in its sheath ; with a pair of dissecting forceps I raised the sheath, and made a small opening into it, which was enlarged to the extent of three-

fourths of an inch, by means of a probe-pointed bistoury. The artery was carefully detached from the femoral vein and saphena branch of the anterior crural nerve with my fingers and the handle of the instrument I had last used; a double ligature was then passed under the artery, with the aneurismal needle in common use, and the upper one tied as high as the vessel had been insulated; when all pulsation in the tumor at that instant ceased: in like manner the other was tied below, and the artery divided between them—both ligatures were laid out immediately opposite their respective nooses—the sides of the wound were brought in contact by the dry future, and the thigh was surrounded with a twelve-tailed bandage, which I found to be the most convenient, as the wound could then be examined without the slightest disturbance to the position of the limb. The patient was then carried to bed—the limb placed as during the operation, and in two hours its heat was equal to that of the sound one—no numbness, pain, or irritation, succeeded to the operation; but the patient complained of a sense of trickling round the knee and throughout the whole course of the tibia; which was readily accounted for, by the blood forcing its passage through the circumflex and collateral branches, in greater quantity than they had been accustomed to carry. In the evening he was prescribed an anodyne draught, consisting of Tinct. Opii. gtts. xlv.

2d day—Slept five hours during the night, and

no bad symptom this morning—tumor sensibly diminished, and the blood in the sac coagulated.

4th day—His cough has been very troublesome during the last thirty-six hours, accompanied with pain in the chest, slight dyspnæa, flushed countenance, and a full pulse, not exceeding ninety-five in the minute; ʒxx. of blood were therefore abstracted from the arm, and as his bowels were constipated, a dose of magnesia vitriolata was immediately directed to be taken; but which, however, proved inert till assisted by a purgative injection. The opiate was ordered to be repeated at bed time.

Next morning (the 5th) he was free from complaint, with the exception of the trickling sensation mentioned above, which, he said, produced a slight degree of pain. This day the wound was examined, and adhesion found to have taken place throughout its whole extent, excepting where the ligatures came out: from these small openings there was rather a copious discharge of serous thin pus; some degree of tension and inflammation also surrounded the wound, but which yielded in twenty-four hours, to the constant repetition of emollient cataplasms laid over the parts every three hours; and, at the expiration of that time, the discharge was found much improved in quality.

No other bad symptom occurred during the remainder of the cure, but the discharge of well secreted pus through the ligature-openings continued until the 14th day, when the last ligature came away.

From this period until the 2nd or 3rd of August the discharge gradually diminished, and the wound was cicatrised on the 7th.

The tumor continued to decrease daily, until his discharge from the hospital.—It was then barely discernible. I heard of him within the last month, when the accounts were so favourable, that, to use his own expression, there was no vestige of the tumor left, and he could then walk without the least *limp*, which, he said, he had not been able to do for years before.

I am strongly inclined to believe that the pneumatic symptoms which immediately succeeded the operation, had been principally instrumental in favoring the extraordinary formation of matter found under the muscle during the cure. The patient's asthmatic complaint was aggravated by this attack, to such an extent, that whenever he coughed, the affected leg and thigh, with the whole frame, were so violently agitated, as to occasion great apprehensions of an hæmorrhage, by detaching the upper ligature from the extremity of the divided artery, during these vehement muscular concussions.

CASE II. &c.

Burnett Allan, seaman, aged thirty-two, was admitted into the hospital for Popliteal Aneurism, on

the 9th November, 1810, from his Majesty's hospital ship Gorgon.

The disease, as near as could be calculated, was then only of three months standing, and for the production of which the patient could assign no ostensible cause. When first the tumor was discovered, it had reached the size of a small walnut *, and continued gradually to increase until the day of the operation, at which period it exceeded half the size of a large lemon, longitudinally and equally divided. Its pulsations were strong, but unaccompanied with pain, except when he walked—the integuments were healthy, and the leg and foot, as in the former case, were slightly œdematous—his general health was good—he was a short muscular man, of a plethoric habit of body; of a mild, patient disposition, never desponding.

During his residence in the Gorgon, the surgeon of that ship requested the opinions of the physician and surgeons of the fleet, with respect to the propriety of performing the operation on board, in the then incipient state of the disease; but these gentlemen advised the operation to be postponed, till the collateral branches should become sufficiently dilated, to ensure a due supply of blood to the

* The circumstance of the tumor remaining undiscovered till it had reached this size, will not appear unaccountable to those who are acquainted with the character and occupations of a British seaman.

limb below, when the great communicating channel should be wholly cut off.

From the opinions of such a respectable body of my professional brethren, at that time, concurring with my own; I delayed the operation, upon the same principle, until the 19th of February following.* Six weeks previous to this, the patient was kept upon low diet. He was bled on the 18th, and his bowels were freely opened.

The operation was then performed in the same manner as described in the foregoing case. The incision, by the outer margin of the sartorius muscle, was three inches in length, and the femoral artery was tied about an inch above where it pierces the tendon of the triceps. There was an embarrassing circumstance, however, attending this operation, which did not occur in the former, and which I think worthy of notice. After having slit open the sheath, and in detaching the artery from the vein and nerve, I discovered a perforating branch, of considerable magnitude, going off from the posterior part of the artery, exactly in the centre between where the two ligatures were to be applied, which, if the utmost caution had not been observed, (with the assistance I obtained from the finger instrument and the ivory handles of the

* Had Mr. Ramsden's valuable observations on this subject sooner met my eye, I might not have delayed the operation, after the patient's admission, longer than was necessary to prepare him.

scalpel and bistoury *) the dissection might have been spoiled, by the profuse issue of blood, and the operation not completed in a desirable manner.

The only difference occasioned by this circumstance was, that it protracted the operation somewhat longer than it otherwise would have been, and necessarily compelled me to pass the aneurismal needle twice under the artery, *viz.* above and below the perforating branch.

It might have been advisable, perhaps, to slit open the sheath a little more downwards, so as to enable me to apply both ligatures below the perforating branch, and thereby preserved the aid of so considerable a vessel, in affording nourishment to the inferior parts of the limb; had not the femoral artery been partly insulated above the branch in question, before it was discovered. I conceive a secondary hæmorrhage, after this operation, is the grand point to be guarded against; and when it does occur, it is, in nine cases out of ten, owing to ulceration of the coats of the artery, from having its cellular connexions to the surrounding parts destroyed above the ligature, which deprives the denuded vessel of its usual supply of nourishment.

Having now exceeded the limits which I originally proposed this paper should extend to, I shall conclude, by merely acquainting the reader, that

* See the annexed Plate, for a description of these instruments.

Fig. 1.



Fig. 2.

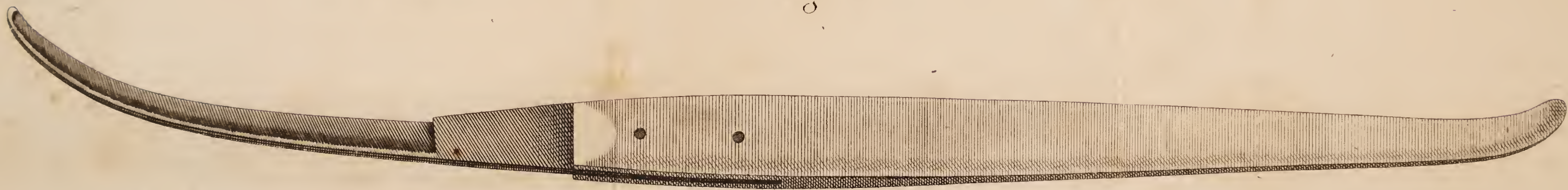
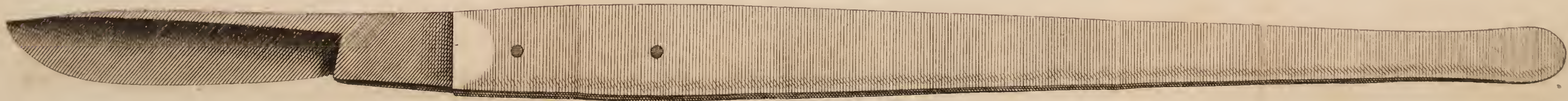


Fig. 3.



throughout the cure there did not occur one untoward symptom. There was no discharge, excepting what arose from the superficial line of the incision, until the 21st day, when the last ligature was removed, which was followed by two or three drops of pus.

All perceptible pulsation had ceased in the aneurismal sac, from the completion of the operation; and, at the period of his dismissal from the hospital, the tumor had entirely disappeared, leaving the limb in full possession of its customary functions.

Several years have now elapsed since it occurred to me, that an instrument was much wanted to retract one side of a deep incised wound, at the bottom of which the surgeon has to tie an artery of magnitude, and particularly so when the femoral artery is to be tied from the outer margin of the sartorius muscle. The fingers of the assistant, hitherto employed for this purpose, occupy so much space in a narrow wound, that the operator, whose finger and thumb must necessarily be in contact with the vessel he wishes to tie, is so much circumscribed for room, as well as his view of the artery so much obscured, that the operation is either indifferently performed or the patient put to unnecessary pain, by the assistant tearing the wound apart, in order to give the

operator the space previously occupied by his fingers. In the first of the foregoing cases of Aneurism, I experienced the want of it so much, that before the performance of the second operation I had the instrument, delineated in the annexed plate, very obligingly sent down to me, by your directions, and which was executed by Mr. Weifs, of London, from a model transmitted for that purpose.

It would be injustice in me if I were not here to acknowledge the assistance I obtained from my ingenious friend and colleague, Dr. Magennis, in the construction of this instrument; who did me the favor, also, to be present at both operations: in the latter of which, the utility of the finger instrument was eminently conspicuous to him, and to all the surgeons of the fleet present. The instrument, as I had originally constructed it, was in respect to shape exactly what it now is, but the fingers, which were to have been of entire thin silver plates, were improved at Dr. Magennis's suggestion, by substituting silver wire of an adequate strength.

I have farther to observe, that the fingers of the instrument form, with its handle, an angle of about 70° .*

* Would not this instrument be applicable to other great operations, where the surgeon's hands and attention are occupied about deep seated parts—for instance, to protect the Intestine in the division of Poupart's ligament in the operation for Femoral Hernia?

The scalpel and bistoury, also delineated in the plate, do not differ from those in common use, otherwise, than that the ends of their ivory handles are thinner ; and one of them is a little curved at its extremity, which will be found very useful in detaching, and also in supporting the artery in the concavity, while you are dividing it with the scalpel ; and this method I prefer to that of dividing the vessel from below upwards with the bistoury.

I have the honor to be,

With every possible degree of respect,

GENTLEMEN,

Your most humble

And most obedient Servant,

A. C. HUTCHISON.

DESCRIPTION OF THE PLATE.

FIG. I—The Finger Instrument, see page 17.

FIG. II—The Bistoury shewing its curved handle, see
page 18.

FIG. III—The Scalpel, see page 18.

